PRO-ACT
A Base-level Pollution Prevention Resource sponsored by HQ Air Force Center for Environmental Excellence

Success Story

SEPTEMBER 1999

Spotlight On: Charleston AFB

Charleston AFB Success Stories

Introduction

Charleston Air Force Base (AFB), an Air Mobility Command (AMC) installation, is located just north of Charleston, South Carolina, and is home to AMC's newest airlifter, the C-17 "Globemaster III." Charleston AFB has a work force of approximately 8,200 military and civilian personnel, and is comprised of nearly 4,000 acres in North Charleston, plus an additional 2,000 acres at their Auxiliary Airfield. The Base also shares runways with the Charleston commercial airport.

The mission of Charleston AFB is to provide worldwide movement of troops, cargo, and passengers. This includes performing aeromedical airlift, humanitarian missions, and air-land/air-drop of troops, cargo, and supplies. The 437th Airlift Wing and the 315th Reserve (Associate Wing), both based at Charleston AFB, are co-users of the Base's C-17 and C-141 fleets. These aircraft receive maintenance support from the 437th Logistics Group (LG) which includes the 437th (C-141B) and 637th (C-17A) Aircraft Generation Squadrons (AGS), the 437th Component Repair Squadron (CRS), and the 437th Equipment Maintenance Squadron. The 437th Civil Engineer Squadron is responsible for design, construction, maintenance, and repair activities on all installation facilities and utility systems. They also provide fire protection and comprehensive environmental management services. The 437th Supply Squadron manages the installation's Hazardous Materials (HAZMAT) Pharmacy, which is the focal point for all hazardous materials and hazardous wastes entering and exiting the installation.

Commitment to Pollution Prevention

Charleston AFB is committed to pollution prevention (P2) and protection of the environment. The installation program is structured to embrace all elements of P2, and focuses on the ultimate elimination of waste generation wherever feasible. Specific programs include reducing and/or eliminating pollutants and the generation of hazardous and toxic wastes through source reduction, reuse, and recycling. Design, construction, maintenance, and operational decisions all incorporate environmental factors. A brief summary of the P2 initiatives instituted by Charleston AFB personnel is presented below. Additional details on these initiatives are contained in subsequent sections.

Opportunity Assessments are carried out each year, and have resulted in significant reductions and savings including:

- A 50% reduction of rags and drums at the Aerospace Ground Equipment (AGE) shop by the use of squeegees to remove small amounts of oil and hydraulic fluid collected in drain pans.
- Antifreeze reclamation in Vehicle Transportation and AGE shops has eliminated six tons of hazardous waste disposal.
- A non-emulsifying aqueous cleaning process replaced the use of naphtha-based (ZEP) cleaner in the Vehicle Transportation Maintenance Shop.
- The use of wash water recycling equipment in the Aircraft Wheel and Tire Shop has resulted in the reduction of hazardous wastewater from 1,500 gallons per year to 550 gallons per year.
- Pesticide use has been reduced by 92% from a 1993 baseline.
- The use of Environmental Protection Agency (EPA) 17 priority pollutants has been reduced by 95% from a 1992 baseline.
- Overall hazardous waste generation has been reduced by 70% since a 1992 baseline.

Recycling of solid wastes, such as aluminum cans, cardboard, high grade and mixed paper, newspaper, glass, scrap metal, tires, type 1 & 2 plastics, and steel cans has resulted in the diversion of more than 2,300 tons from the county incinerator. Total cost avoidance for the recycling program during calendar years 1997 and 1998 was over $140,000, and sales of recyclables garnered an additional $50,000. Specific totals for recyclable materials are:

JP-8 and Oils	178 tons
Florescent bulbs	8,800 bulbs
Batteries	10.3 tons
Used tires	89 tons
Scrap metal	185 tons
Commingled (glass, aluminum, plastic)	121 tons
Paper	270 tons
Corrugated cardboard	500 tons

There are more than 300 International Merchant Purchase Authority Card (IMPAC) cardholders at Charleston AFB. Training is provided to new cardholders on **affirmative procurement** purchasing requirements. As new contracts are written, the purchase of environmentally friendly products is encouraged whenever possible, including products made from post-consumer materials. The installation has been purchasing office paper, bags, tubes, primer, pipes, and other items that are free of lead and chromate, and has been purchasing re-treaded vehicle tires wherever they are allowed.

During 1997 and 1998, the **training and education** programs at Charleston AFB have trained more than 70 individuals in pollution prevention and 1800 in hazardous waste avoidance.

Charleston AFB participates in a unique **partnership** with HQ AMC, Boeing, and the System Program Office (SPO) for the C-17 whose focus is the reduction and elimination of the use of hazardous materials during the design, manufacturing, procurement, operation, and maintenance of the C-17A fleet. The partnership is called the C-17 Pollution Prevention IPT, and members from Charleston AFB's Environmental Flight (CEV) and Logistics Group take part in its weekly teleconferences and biannual meetings.

A Pollution Prevention Alliance between the State of South Carolina and the Department of Defense (DoD). This partnership recognizes and promotes pollution prevention as the preferred environmental alternative for enhancing mission readiness, while maintaining and exceeding compliance requirements, reducing demand on State and installation resources, and reducing the generation of pollution. Charleston AFB was the first federal installation awarded membership in the **South Carolina Environmental Excellence Program**, which recognizes organizations committed to protecting and preserving South Carolina's environment.

In a continuing **community outreach** effort, the installation has been hosting an annual Earth Day Celebration since 1994. In 1999 alone, more than 1,500 fifth grade students and teachers from Charleston County schools attended this celebration, where they gained insight on the value of being good environmental stewards. During past Earth Day Celebrations, exhibitors have come from as far away as Columbia, the State capitol, to attend the activities at Charleston AFB. More than 30 exhibitors from installation organizations, local governments, local business leaders, and HQ AMC gather at the Base Recreation Area to exchange information on programs and ideas associated with Earth Day, recycling, pollution prevention, and preservation of the environment. Charleston AFB has also been aggressively planting trees throughout the installation since 1993, and the Arbor Day Foundation has named Charleston AFB a "Tree City USA" for five years.

Pollution Prevention and Compliance Successes

437th Civil Engineer Squadron Programs

Mr. Tesfa Abraha is the Pollution Prevention Program Manager for the 437th Civil Engineer Squadron (437 CES/CEVQ). Among the many projects Mr. Abraha administers is the publication of a **Base Recycling Program Newsletter**. The newsletter, published quarterly, is distributed to all office, shop, and family housing personnel on the installation. Its purpose is to disseminate information concerning what is and is not recyclable, where to take recyclable materials, when recyclables are picked up in the industrial and office sections of the installation, and when they are picked up in the military family housing areas. It also provides a detailed accounting of how the installation is progressing towards its recycling goals. Past articles have keyed on Earth Day activities, the HAZMAT Pharmacy, household hazardous wastes, and the free issue "Stop and Swap" program.

Personnel from the Compliance and Pollution Prevention office speak at newcomer's briefings, Commander's calls, in offices and shops, and at local civic group meetings on the installation's recycling programs and goals. A list detailing materials recommended for recycling is also distributed at these gatherings. Senior Airman Rod Sarlat, the installation's Recycling Manager, attributes the successes Charleston AFB has had with its recycling program to the frequent dialog Pollution Prevention personnel have with personnel across the installation, including contractors and members of the Air Force Reserve and Air National Guard – all of whom participate in the installation's recycling program. To further encourage recycling and pollution prevention, Mr. Abraha presents a Pollution Prevention award at each quarterly Environmental Protection Committee (EPC) meeting. This award is given to an individual, office, or shop and recognizes outstanding recycling or pollution prevention efforts during the previous quarter.

Another of the 437 CES/CEV projects is the fostering of waste reduction in all offices on Charleston AFB. This is being encouraged by the use of desktop "mini bins," which are small (approximately 6" high by 5" in diameter) trash cans, which are rapidly replacing all office desk-side trashcans throughout the Installation. The small size of the mini bins encourages people to put recyclable materials in appropriate containers in the office, and put "true" wastes in their personal mini bin, which must be emptied in a waste container in a break room or hallway when they become full. Mr. Abraha has noted that, when people segregate their office recyclables (95% of which is paper) from wastes, very little is deposited in the mini bins and they do not require emptying very often. The mini bins themselves are made from recycled plastic and are stamped with the "Team Charleston Recycling Program" emblem and the statement "This is all the garbage I make!" Institution of the mini bins is being credited with having a significant impact on reducing the amount of money Charleston AFB pays for disposing of trash in the county incinerator.

In another effort, organizations that receive materials on wood pallets now take their excess pallets to the installation's Aerial Port Squadron, which has a continuing need for them. This 100% reuse initiative saves the Aerial Port Squadron from purchasing new pallets, and keeps other organizations from having to pay for their pickup and disposal.

Desktop "mini bins" used by Charleston AFB to encourage recycling of office wastes.

Curbside pickup of recyclable materials is conducted in military family housing every two weeks. This has proven to be an effective time

span, allowing most housing residents to fill their recycling containers in that length of time. If a resident finds that they have accumulated more recyclable materials in a shorter amount of time, there are two recycling centers located on the installation. Anyone assigned to Charleston AFB (military or civilian) can take materials to either recycling center at any time. There are containers for segregating different types of recyclable materials, and a dumpster is provided for large items, such as used furniture and scrap metal. Scrap metal and aircraft tires are turned in directly to the Defense Reutilization and Marketing Office (DRMO) for recycling.

With the arrival of the C-17 aircraft at Charleston AFB, many modifications were necessary to the flightline and aircraft parking ramps. These modifications resulted in the generation of approximately 24,000 tons of used concrete. Much of this concrete was crushed and reused in the manufacture of new concrete. However, a significant amount contained metal reinforcement bars (rebar) that could not be used in this manner. Mr. Al Urrutia, Restoration, Conservation and Planning Element Chief (437th CES/CEVP), has been overseeing a project which will combine the efforts of the Air Force, the Army Corps of Engineers, the South Carolina Department of Natural Resources, and Coastal America, to use this material to form an off-shore ocean reef. This project is still in the coordination phase; however, if all goes as planned, the concrete will be processed through a "rock tine" to remove dirt and small objects. It will then be taken to the docks and be turned over to the Corps, who will have it placed on barges and moved to a designated area for dumping to form the reef. Similar artificial reef projects in other areas have proven to be good for fish and other sea life. They also become good areas for recreational diving and fishing. Charleston AFB looks at this project as a win-win situation; it puts the excess concrete to good use as a reef, an environmentally sound disposal technique, and it saves the Air Force the money it would have cost to dispose of the concrete as a waste.

Charleston AFB was one of the first Air Force installations to construct a propane fire training pit. By no longer using off-specification jet fuel for fire training purposes, they have eliminated a potential source of soil and water contamination. In addition, propane burns more cleanly than jet fuel, thereby reducing air pollution.

Another successful P2 project was the elimination of all water-related permits except an installation general stormwater permit. The previous individual National Pollutant Discharge Elimination System (NPDES) stormwater permit, issued along with the general stormwater permit, required monthly sampling/monitoring at seven outfalls around the installation, requiring a significant and continuous demand for manpower and funds for analysis. Extensive research into why the installation was first issued the individual stormwater permit, coupled with years of compliant stormwater data, allowed the installation to provide state regulators with a better understanding of the operations at the outfalls. This understanding in turn led to an agreement that the installation could forgo the individual stormwater permit, and its sampling/monitoring requirements, in lieu of the general stormwater permit.

The 437 CES maintains a **Treatment, Storage, and Disposal Facility (TSDF)** on the installation. The TSDF possess a Resource Conservation and Recovery Act (RCRA) Part B Permit, and is operated by Mr. Harold Singletary and Ms. Carolyn Wright. One of the innovative programs managed by TSDF personnel is the disposition of used oils (all types) and fuels that cannot be reused on the installation. These used oils and fuels are collected in aboveground storage tanks, and then donated to the Santee-Cooper Power Company, who in turn burns them for energy recovery in their local power plant. Prior to transferring the oil/fuel to Santee-Cooper, installation Bioenvironmental Engineering Services (BES) personnel sample the tanks to ensure the contents do not exceed Santee-Cooper's maximum water content requirements. In 1998 25,000-gallons were donated, and so far in 1999, an additional 10,000-gallons have been donated. Donating the oil/fuel is an environmentally preferable alternative to disposal, and also saves the installation a considerable amount of money in disposal costs.

The hard work by 437 CES/CEV, and in particular Mr. Abraha, in establishing successful pollution prevention programs at Charleston AFB was recognized by Ms. Ruby Demesme, Assistant Secretary of the Air Force, Manpower, Reserve Affairs, Installation and Environment during a recent visit to the installation. Additional information on the 437 CES/CEVQ's P2 and compliance programs may be obtained from Mr. Abraha at DSN 673-2690 or E-mail: tesfa.abraha@charleston.af.mil.

437th Logistics Group Programs

In 1993, the 437th Logistics Group (LG) Commander established an Environmental Manager position within the Group. Held by Mr. Dale Cook since its inception, this position is unique within the Air Mobility Command. Simply stated, the position was created to establish stability and corporate knowledge on the environmental status and needs of the Logistics Group at Charleston AFB, which owns 25 of the 36 accumulation points on the installation. One of Mr. Cook's most important tasks is ensuring that everyone in the LG community who uses hazardous materials and/or generates hazardous wastes is aware of their responsibilities and the part they play in maintaining compliance. The diligence of Mr. Cook and the LG community is evidenced in the fact that since the LG Environmental Manager position was created in 1993, the 437th Airlift Wing has received no fines or penalties from annual no-notice hazardous waste compliance inspections conducted by the South Carolina Department of Health and Environmental Control.

To increase environmental awareness, Mr. Cook conducts environmental training, which includes RCRA compliance, hazardous material, hazardous waste, stormwater, air emissions, and pollution prevention training for all personnel assigned to the entire wing. CEV developed the original RCRA course in 1994, however, Mr. Cook has conducted this training since 1995 and continually updates the course in order to broaden the knowledge of his "students." Examples of updates include information on HAZCOM spill response storm water pollution prevention training. Since November 1995, over 3,000 people have received this training which is offered three to five times each month. Mr. Cook's training program is credited with helping the installation achieve hazardous waste generation rates that are well below the goal established by HQ AMC for each of its installations. During CY 1996 the installation was 90,000-pounds under the goal, and in CY 1998 it was 80,000-pounds under AMC's goal! Much of this success can be directly attributed to the training personnel receive in Mr. Cook's classes.

Mr. Cook spends a considerable amount of his time visiting the LG facilities, and is known by name in most other facilities on the installation as well. Each of the squadrons in the Logistics Group has a dedicated Environmental Manager who receives additional environmental training, and works closely with Mr. Cook and the installation Environmental Flight. Crew Chiefs and alternates are also designated within each squadron to manage each of the Hazardous Waste Accumulation Points. They ensure proper segregation of wastes at their accumulation points, and arrange for movement of the wastes to the TSDF when allowable limits are reached. This multi-level approach to environmental management has helped the Logistics Group achieve outstanding success in excelling beyond environmental compliance requirements.

An initiative developed by the 637 AGS is the **HAZMAT Mini Pharmacy** which provides flightline and shop maintenance personnel with a conveniently located, 24-hour hazardous material issue and turn-in point. The Mini Pharmacy, whose operation is directed by MSgt Duane Arnold, 637 AGS Environmental Program Manager, DSN 673-2502, is supported by the main HAZMAT Pharmacy, and in-turn supports the flying operations of the entire 437th Airlift Wing by stocking materials required for all maintenance activities, including Time Compliance Technical Order (TCTO) work. Mini Pharmacy personnel track issuance's and receipts with the use of a bar code reader and a Microsoft Excel® program, and maintain all Material Safety Data Sheets (MSDS) for products used on the flightline and in the shops. In fact two separate MSDS files are maintained, one for products that are currently in use, and another for products no longer used that can be accessed for historical information purposes. Personal protective equipment (PPE) for flightline and shop personnel is also issued from the Mini Pharmacy, as are stocks of absorbent materials ready for immediate use. The Mini Pharmacy has also established, and maintains, a spill response trailer that contains absorbent materials and a "Tiger Vac"® combustible-liquid vacuum cleaner. To increase the amount of spill residue that can be placed in 55-gallon drums, Mini Pharmacy personnel worked with Mr. Cook and the installation Environmental Flight to install a drum compactor in their facility. With the approval of the South Carolina Department of Health and Environmental Control, the Mini Pharmacy now uses the waste compactor to

completely pack each drum of waste absorbents prior to shipment for disposal. In addition to these functions, the Mini Pharmacy also serves as a recycling center, which operates at "no cost." All recyclable materials (aluminum and steel cans, glass, cardboard, paper, fluorescent bulbs, etc.) are accepted. Some materials are given directly to recycling companies, while others are turned over to the main HAZMAT Pharmacy for recycling. The Mini Pharmacy recycling program is very convenient for flightline and shop personnel, and there is good participation in this program.

TSgt Tim Barber, the Non-Commissioned Officer in-charge (NCOIC) of the main **HAZMAT Pharmacy** oversees the issue and turn-in of all hazardous materials and wastes at Charleston AFB. The pharmacy also issues materials to the AGS's Mini pharmacy, thus ensuring products are available to flightline and shop maintenance personnel 24-hours a day, 7-days a week. The main pharmacy uses the Air Force Environmental Management Information System (AF-EMIS) to track all materials from receipt to issue, use, and turn-in. One of the more notable initiatives of the HAZMAT Pharmacy is the recycling of all steel 1-quart engine oil and hydraulic fluid cans used to maintain aircraft. Using locally available materials and their own manpower, pharmacy personnel constructed a sloped table that allows each can to be completely drained of residue in approximately 24-hours. A home made plunger device punctures a hole through the top and bottom of each can just prior to being placed on the drain table. Since operation of this State-approved program was instituted in 1994, over 43,000-pounds of steel cans have been turned in to the Charleston County Recycling Center, and over 2,900-gallons of engine oil and hydraulic fluid have been collected and turned in to the TSDF for donation to the Santee-Cooper Power Company.

HAZMAT Pharmacy personnel visit shops on a regular schedule to pick-up unused hazardous materials. If possible, these materials are subsequently re-issued to other users. However, if their shelf life has expired, they are either given to the "Stop and Swap" self help store for use by family housing residents, or processed for proper disposal. The pharmacy also accepts all recyclable materials and sells all used metal and plastic 55-gallon drums the installation cannot use to a local company. Additional information on the HAZMAT Pharmacy may be obtained by contacting TSgt Tim Barber, DSN 673-5855.

Steel oil and hydraulic can drainage table constructed by HAZMAT Pharmacy personnel.

The 437th Equipment Maintenance Squadron (EMS) **Wheel and Tire Shop** is responsible for the maintenance and repair of all aircraft wheels and tires. The shop recently placed a Landa Water Cleaning Unit in operation that works in conjunction with their Better Engineering Jet Washer. On a monthly basis, the wash water from the Jet Washer is piped through the Water Cleaning Unit, which uses clay and filter paper to remove the impurities from the water. Prior to adding the Landa Water Cleaning Unit to the Jet Washer, the shop generated seven 55-gallon drums of contaminated water every quarter that had to be disposed of as hazardous waste. Now, only about 3-4 pounds of clay are used per monthly cycle, and the procedure allows the water to be used for one year before it requires disposal as a hazardous waste. For more information on the Landa Water Cleaning Unit, contact TSgt Michael Hall, DSN 673-4751.

Pollution prevention initiatives have also been instituted at the installation's 437th Transportation **Vehicle Maintenance Shop**. One of these initiatives involved the modification of their R-12 refrigerant recovery unit to allow them to use it for servicing vehicle air conditioning systems that have been converted to R-134a refrigerant. The shop already had an R-134a refrigerant recycling unit; however, with the number of vehicles in the fleet, a second recovery unit was needed to reduce vehicle down time. According to MSgt Mark Johnson, Vehicle Maintenance Shop Superintendent, all installation vehicle R-12 air conditioning systems were converted to the mineral oil-based R-134a

Landa Water Cleaning Unit (left) connected to a Better Engineering Jet Waster (right) in the Wheel and Tire Shop.

refrigerant at a total cost of approximately $300. Because the use of R-12 had been eliminated, the shop could convert the recovery unit to handle R-134a.

The Vehicle Maintenance Shop also uses re-refined motor oil in its vehicle fleet, and is in the process of becoming a member of the Defense Supply Center Richmond's "Closed Loop" re-refined oil program. In addition, the shop has switched to High Volume - Low Pressure paint equipment in its vehicle paint facility. This equipment produces less air emissions than conventional systems. The shop purchased four Snap-On HVLP paint guns for $250 each, and one Accuspray HVLP paint gun for $400. Plans are to purchase an additional Accuspray gun, giving the shop a total of six HVLP paint guns. An antifreeze recycling unit is also used, and has reduced purchase of new antifreeze by 50 percent. Personnel have established a recycling center in a corner of the main shop building where there are receptacles for all types of recyclable materials. These are taken to the HAZMAT Pharmacy when the containers are full. For further information on the P2 initiatives of the Vehicle Maintenance Shop, contact MSgt Mark Johnson, Shop Superintendent, DSN 673-4194.

The **Engine Test Cell**, operated by Boeing since January 1998, continues to donate its mixture of JP-8 and engine preservative (1010 oil) for use in AGE, a practice originally developed by the 437th Component Repair Squadron. Because the JP-8/ oil mixture cannot be segregated at the point of generation, it was previously turned in for disposal as a non-regulated waste. The donation initiative was begun when CRS personnel questioned the necessity of disposing of the mixture, and verified that its flash point was within the limits required by AGE units. Since 1996 over 2,400-gallons have been collected for use in powered ground support equipment throughout the installation. Additional information on this topic may be obtained by contacting Mr. Furmanek, Boeing, (843) 740-7587, or Senior Master Sergeant Allan McClellan, AGE Superintendent, DSN 673-4724.

The EMS **Fabrication Flight** paint booth was converted from a waterfall system to dry filter system in 1996. Disposal costs for the contaminated water

previously generated were approximately $16,987 per year. Since the conversion, they have spent only $760 each year for disposal of used filters. In addition, the Fabrication Flight has stopped using chemical paint strippers in lieu of plastic bead blasting equipment. Additional information on the Fabrication Flight's paint booth may be obtained by contacting Mr. Charles Crawford, Structural Maintenance Shop Chief, DSN 673-4688.

JP-8 fuel **storage tank water bottoms** and **flightline fuel pit water** are processed through one designated oil/water separator on the installation. An agreement between the installation Fuels Shop, the Base Environmental Office, and the North Charleston Sewer District, was reached in October 1995 allowing this practice, which has saved Charleston AFB over $800,000 in disposal costs! Further information may be obtained by contacting Technical Sergeant (TSgt) Scott Lorick, DSN 673-5755.

Success - How Did Charleston Achieve It?

Mr. Glenn Easterby, 437 CES/CEV Flight Chief, stated that besides receiving excellent commitment from supervisors at all levels, and having outstanding people working in the installation's environmental and pollution prevention programs, a key factor in the success the installation has enjoyed in its P2 programs is the level of cooperation demonstrated by Mr. Abraha and Mr. Cook. He said both individuals are highly motivated and dedicated to preserving the environment through pollution prevention. Mr. Easterby stated that these two people have worked together to bring to fruition the many superb P2 programs in place on the installation, and this has been to the great benefit of all Charleston AFB employees and personnel. Mr. Easterby highly recommends all Air Force installations with a flying mission authorize an LG Environmental Manager position.

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